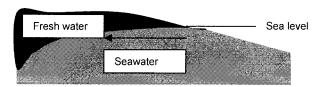
## W. F. Humphreys 25 August 2006

Conceptual model of potential contamination of anchialine system as result of episodic (e.g. cyclone) recharge of the salt water component of the system.

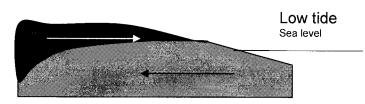
Key questions: Is this a real threat? What is the fate of petroleum in anchialine systems?

Weak indications from Bundera Sinkhole (Humphreys 1999) and Barrow Island (Humphreys 2002) are consistent with a chemolithotrophic element to the food chain but it should be properly tested. Barrow Island provides perfect model as the anchialine system has been the repository for oily produced water and probably also has naturally discharging petroleum into the groundwater, together with hydrogen sulphide (Humphreys 2002).

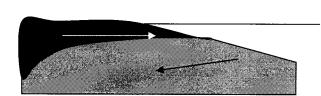
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Freshwater-seawater interface: FW discharges at mean tide level (established literature). Freshwater generally outflowing so any threat to marine not the GW system.



If seawater wedge is in recharge phase (see Michael et al 2005), then at low tide an oil contaminated ocean could enter seawater part of anchaline system and circulate inland and then entrain with FW outflow, contaminating FW as well and eventually discharging to ocean.



## Sea level

High tide

## References

Humphreys, W. F. 1999. Physico-chemical profile and energy fixation in Bundera Sinkhole, an anchialine remiped habitat in north-western Australia. *Journal of the Royal Society of Western Australia* 82: 89-98.

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